

In the Claims:

Please amend claims 1 and 6. Please cancel claims 16-20. The claims are as follows:

1. (Currently amended) A method for monitoring a nitridation process, comprising:

- (a) providing a semiconductor substrate;
- (b) forming a dielectric layer on a top surface of said substrate;
- (c) introducing a quantity of interfacial species into said substrate;
- (d) measuring the density of interface traps between said substrate and said dielectric layer;
- (e) providing a predetermined relationship between said quantity of said interfacial species and said density of said interface traps; and
- (f) determining the quantity of said interfacial species introduced based on said relationship.

2. (Original) The method of claim 1, wherein said interfacial species is selected from the group consisting of nitrogen, oxygen, carbon and germanium.

3. (Original) The method of claim 1, wherein said relationship is in the form of a graph, an equation or a table.

4. (Original) The method of claim 1, wherein said dielectric layer includes silicon oxide or a high

dielectric constant dielectric material.

5. (Original) The method of claim 1, wherein said step (c) introduces said interfacial species by ion implantation, rapid thermal ammonia anneal, rapid thermal nitric oxide anneal, rapid thermal nitrous oxide anneal or nitrogen plasma.

6. (Currently amended) A method for monitoring a nitridation process, comprising:

- (a) providing a semiconductor substrate;
- (b) forming a first dielectric layer on a top surface of said substrate;
- (c) introducing a quantity of interfacial species into said substrate;
- (d) removing said first dielectric layer;
- (e) forming a second dielectric layer on said top surface of said substrate;
- (f) measuring the density of interface traps between said substrate and said second dielectric layer;
- (g) providing a predetermined relationship between said quantity of said interfacial species and said density of said interface traps; and
- (h) determining the quantity of said interfacial species introduced based on said relationship.

7. (Original) The method of claim 6, wherein said relationship is linear within at least a range of quantity of said interfacial species introduced.

8. (Original) The method of claim 6, wherein said relationship is graphical in form, in the form of an equation or in the form of a table.

9. (Original) The method of claim 6, wherein said substrate is a bulk silicon substrate or a silicon-on-insulator substrate.

10. (Original) The method of claim 6, wherein said interfacial species includes nitrogen.

11. (Original) The method of claim 6, wherein said interfacial species includes oxygen, carbon or germanium.

12. (Original) The method of claim 6, wherein said first dielectric layer includes silicon oxide.

13. (Original) The method of claim 6, wherein said second dielectric layer includes silicon oxide or a high dielectric constant dielectric material.

14. (Original) The method of claim 6, wherein said step (c) introduces said interfacial species by ion implantation.

15. (Original) The method of claim 6, wherein said step (c) introduces said interfacial species by rapid thermal ammonia anneal, rapid thermal nitric oxide anneal, rapid thermal nitrous oxide

annal or nitrogen plasma.

16-20. (Canceled)

10/605,244

6